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In the Supreme Court of the United States

OCTOBER TERM, A. D. 1947.

No. 280.

FUNK BROTHERS SEED COMPANY,
Petitioner,

vs.

KALO INOCULANT COMPANY,
Respondent.

BRIEF FOR PETITIONER.

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INDEX.

The Opinions Below 1

Jurisdiction 1

Statement of the Case 2

The Issue 3

The Subject Matter 4

The Art Prior to Bond 4

The Alleged Invention of Bond 9

The Essence of the Bond Invention 13

Holding of the Courts Below 15

The Errors Assigned and to be Argued 16

Summary of Argument 16

Argument 19

I. No Patent Can Be Sustained for Monopoly of a Law of Nature of a Product or Composition of Matter 19

The Subject of the Bond Patent is Not Within the Classification of R. S. 4886 27

II. Can the Discoveries of the Laws of Nature and of Natural Products, Without Further Contribution By the Discoverer, Be the Subject of Patent Monopoly Under the Patent Statute R. S. 4886, Or Do They Belong to the Public? 28

III. An Old Product or Products of Nature in Combination Cannot Be Patented By a Mere Discovery Of a New Quality Existing In Nature. Under Sec. R. S. 4886 a Combination to Be Patentable Must Be Both New and Useful and Based Upon a Contribution to the Public Not Existing In Nature 33

Vitamin Technologists Case 36

IV. A Product Claim That Relies For Its Novelty Upon a Statement of Function is Invalid 38

Patentability of a Claim Involving a Mental Operation 39

Non-Patentability of Therapeutic Methods 41

V. Public Importance 42

APPENDICES:

A. Pertinent Statutes 44

B. Bond Claims in Suit 46

C. Excerpt From Judge Healy's Concurring Opinion in Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation, 146 F. (2d) 941, 954 (C. C. A. 9) 48

TABLE OF AUTHORITIES.

Cases.

Altoona Public Theatres, Inc. v. American Tri-Ergon Corp. et al., 294 U. S. 477, 55 S. Ct. 455, 79 L. Ed. 1005 35

American Fruit Growers, Inc. v. Brogdex Company, 283 U. S. 1, 51 S. Ct. 328, 75 L. Ed. 801 27

Boston Pencil Pointer Co. v. Automatic Pencil Sharpener Co. (C. C. A. 2) 276 Fed. 910 31

Brinkerhoff, Ex parte, Commissioner's Manuscript Decision, Vol. 24, page 349, Case No. 132; 27 J. P. O. S. 797 ..... 41, 42

Burr v. Duryee, 1 Wall. 531, 17 L. Ed. 650 25

Cochrane v. Deener, 94 U. S. 780, 24 L. Ed. 139 41

Collar Co. v. Van Dusen, 23 Wall. 530, 23 L. Ed. 128 ... 30

Cuno Engineering Corporation v. Automatic Devices Corporation, 314 U. S. 84, 62 S. Ct. 37, 86 L. Ed. 58 29

DeForest Radio Co. v. General Electric Co., 283 U. S. 664, 51 S. Ct. 563, 75 L. Ed. 1339 ..... 24-25, 35

Dennis et al. v. Pitner et al., 146 F. (2d) 142 15

Don Lee, Inc. v. Walker, 61 F. (2) 58 (C. C. A. 9) 40

Foley, Admx. of Gathmann v. U. S., 260 U. S. 667, 43 S. Ct. 240, 67 L. Ed. 451 35

General Electric Co. v. DeForest Radio Co. (C. C. A. 3), 28 Fed. (2d) 641 26

General Electric Co. v. Wabash Appliance Corp., 304 U. S. 364, 58 S. Ct. 899, 82 L. Ed. 1402 ..... 39, 40

Halliburton Oil Well Cementing Co. v. Walker et al., 329 U. S. 1, 67 S. Ct. 6, 91 L. Ed. 15 ..... 2, 38, 40, 41

Hazel-Atlas Glass Co. v. Hartford-Empire Co., 322 U. S. 238, 64 S. Ct. 997, 88 L. Ed. 1250 42

Holland Furniture Co. v. Perkins Glue Co., 277 U. S. 245, 48 S. Ct. 474, 72 L. Ed. 868 41

Hotchkiss v. Greenwood, 11 How. 248, 13 L. Ed. 683 ... 34

J. E. Baker Company v. Kennedy Refractories Company et al. (C. C. A. 3), 253 Fed. 739 25

LeRoy et al. v. Tatham et al., 14 How. 156, 14 L. Ed. 367 ..... 22, 23, 24, 36

Mackay Radio & Telegraph Co. v. Radio Corporation of America, 306 U. S. 86, 59 S. Ct. 427, 83 L. Ed. 506 31

Mercoid Corp. v. Mid-Continent Investment Co., 320 U. S. 661, 64 S. Ct. 268, 88 L. Ed. 376 42

Mills, Ex parte, 366 O. G. 477 42

Morton v. New York Eye Infirmary (C. C. N. Y. 1862), Fed. Cas. 9865, 17 Fed. Cas. 881 ..... 20, 36, 42

Morton Salt Co. v. Suppiger Co., 314 U. S. 488, 62 S. Ct. 402, 86 L. Ed. 363 42

Novocol Chemical Manufacturing Co., Inc. v. Powers & Anderson Dental Company (C. C. A. 4), 128 F. (2d) 904 27

O'Reilly et al. v. Morse et al., 15 How. 62, 14 L. Ed. 601 23

Old Town Ribbon & Carbon Company, Inc. v. Columbia Ribbon and Carbon Mfg. Co. (C. C. A. 2), 159 F. (2d) 379 ..... 34, 38

P. E. Sharpless Co. v. Crawford Farms, 287 Fed. 655 (C. C. A. 2) 28

Precision Instrument Manufacturing Co. et al. v. Automotive Maintenance Machinery Co., 324 U. S. 806, 65 S. Ct. 993, 89 L. Ed. 1381 43

Rubber Tip Pencil Company v. Howard, 20 Wall. (87 U. S.) 498, 22 L. Ed. 410 35

Smith v. Nichols, 21 Wall. 112, 88 U. S. 112, 22 L. Ed. 566 24

Standard Brands, Inc. v. National Grain Yeast Corporation, 308 U. S. 34, 60 S. Ct. 27, 84 L. Ed. 17 38

Telephone cases, 126 U. S. 1, 8 S. Ct. 778, 31 L. Ed. 863 24

Toledo Pressed Steel Co. v. Standard Parts, Inc., 307 U. S. 350, 59 S. Ct. 897, 83 L. Ed. 1334 34

Union Carbide Co. v. American Carbide Co. (C. C. A. 2), 181 Fed, 104 25

United States v. Masonite Corp., 316 U. S. 265, 62 S. Ct. 1070, 86 L. Ed. 1461 42

Universal Winding Co. v. Foster Machine Company, 16 F. Supp. 671 (D. C. Mass.), affirmed (C. C. A. 1) 90 F. (2d) 472 26

Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation, 146 F. (2d) 941, C. C. A. 9 ..... 36, 37

Statutes.

R. S. 4886, 35 U. S. C. A. 31 ..... 2, 3, 16, 17, 28, 29, 30, 32, 33, 44

R. S. 4888, 35 U. S. C. A. 33 ..... 18, 44

28 U. S. C. 347 1

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BRIEF FOR PETITIONER.

THE OPINIONS BELOW.

The opinion of the Circuit Court of Appeals for the Seventh Circuit is reported at 161 F. (2d) 981. The decision of the District Court is unreported, but the Memorandum of Holdings of the Court is contained in the Record at page 744, the Findings of Fact and Conclusions of Law at pages 745 to 753, and the Judgment at page 754.

JURISDICTION.

This case is here on a writ of certiorari, under the provisions of U. S. Code Title 28, Sec. 347, granted October 13, 1947.

STATEMENT OF THE CASE.

The Respondent brought suit against the Petitioner for infringement of United States Letters Patent to Varley Sherman Bond, No. 2,200,532 issued May 14, 1940. Respondent limited its charge of infringement to the product claims of the patent,[1] except product claim 2.

Petitioner filed a counterclaim asking for a Declaratory Judgment as to the invalidity of the entire Bond patent for it also contains claims directed to a method of making the product.

The District Court held the product claims invalid on the ground that they did not involve "any new and useful art, machine, manufacture or composition of matter" (R. 744), under the Patent Statute R. S. 4886[2] but if valid, infringed and dismissed Petitioner's counterclaim.

Respondent appealed the decision of the District Court to the Circuit Court of Appeals for the Seventh Circuit (R. 755) and the Petitioner cross-appealed so much of the decision of the District Court as related to the dismissal of the counterclaim and the holding of infringement by the product of the Petitioner. (R. 759.)

The Circuit Court of Appeals for the Seventh Circuit reversed the District Court, holding the claims in suit valid, sustained the District Court's holding of infringe-

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[1] The product claims in suit are 1, 3, 4, 5, 6, 7, 8, 13 and 14. Claim 4 is an example (all claims in suit are in the Appendix page 46):

> "An inoculant for leguminous plants comprising a plurality of selected mutually non-inhibitive strains of different species of bacteria of the genus Rhizobium, said strains being unaffected by each other in respect to their ability to fix nitrogen in the leguminous plant for which they are specific."

Please note that the claims describe the product in terms of function. *Halliburton Oil Well Cementing Co. v. Walker*, 329 U. S. 1, 9.

[2] R. S. 4886, 35 U. S. C. A. Sec. 31. See Appendix page 44.

ment of the claims in suit and reversed the District Court's dismissal of the Petitioner's counterclaim. (R. 834.)

THE ISSUE.

The Circuit Court of Appeals reversed the District Court's decision that the product claims of the Bond patent do not involve "a new and useful art, machine, manufacture or composition of matter" under the Patent Statute R. S. 4886.

This case involves the fundamental question of whether "the discovery of a natural phenomenon, or of a quality or attribute of a well-known article and application of that quality in a successful combination which is of value to mankind," as held by the Circuit Court of Appeals,[3] is patentable.

The position of the Petitioner, from the inception of the case, has been:

(1) that the Bond theory of inhibition between different species of the legume bacteria is not true as a general condition;

(2) if the Bond theory is true, then Bond in discovering this fact merely discovered the workings of the laws of nature with respect to the functioning of the bacteria in the mixed inoculants of the prior art; and nothing more was added by Bond to constitute invention of a composition of matter.

(3) Even under the assumption that Bond was the first to discover that non-inhibitive legume bacteria exist in nature, a mere selection of these natural elements and use of them in their natural form to produce their natural function without change in a well-known old composition is not patentable under the Patent Statute R. S. 4886.

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[3] Rec'd 824.

THE SUBJECT MATTER.

The Bond patent falls in the art of bacterial inoculants for use on the seed of leguminous plants to carry bacteria into the ground for the purpose of infecting the roots of leguminous plants. The leguminous plants are those that draw nitrogen from the air and fix it in the plant for conversion to organic nitrogenous compounds, so that when the plants are turned under the soil the nitrogenous compounds in the plants become available for absorption by subsequent crops. The purpose of the inoculant is to place in the soil the proper species of bacteria for the particular leguminous plants to increase the efficiency of the nitrogen fixation effect of the plants, and thus make more nitrogen available in the soil for subsequent crops.

THE ART PRIOR TO BOND.[4]

Many years ago, scientists in this art discovered that when bacteria of the genus Rhizobia infect the roots of leguminous plants, the plants would draw nitrogen from the air and fix it within the plant so that the nitrogen would become available in the soil for absorption by subsequent plant crops. "The mechanism of this nitrogen fixation is not understood at the present time," (R. 772, line 9) but it is a natural phenomenon or result caused by the natural functioning of the bacteria upon infecting the roots of the leguminous plants and in some mysterious way cause the plants to fix nitrogen from the air when the plant and the bacteria get together.

Scientists also discovered that the bacteria of the genus Rhizobia can be classified generally into six fairly well

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[4] Petitioner wishes to be distinctly understood that it does not urge anticipation by reason of the prior art because it makes no difference whether Bond's ideas are new or old—there is no invention. A discussion of the art is given as a background for understanding what Bond claims as invention, what he discloses, and what is admittedly old.

defined cross-inoculation groups.[5] By cross-inoculation group is meant that the bacteria for one group will not normally infect the roots of the leguminous plants of another group to cause the nitrogen fixation in the plant.

The scientists were not long in discovering that in the various species of bacteria of the several cross-inoculation groups there existed many individual strains of bacteria and that they vary greatly in their natural ability to fix nitrogen in the plants for which they are specific. Some of these individual strains are weak and thus inefficiently cause fixation of nitrogen in the plant whereas other strains are strong and thus cause efficient nitrogen fixation in the plant. Thus, it was soon found necessary to make every effort "to select strains of the bacteria which are known to be of decided benefit to the host plant, and to keep these tested cultures under conditions which will maintain the organisms in an active state." (P. X. 13, R. 401, 68.)

For many years those working in this bacteriological field have isolated many individual strains of bacteria of the several cross-inoculation groups and have tested the strains by a scientific test procedure that is known to all bacteriologists in this field, to determine the effectiveness of the various strains of the bacteria so that they could discard the weak strains and retain the strong strains from which a bacterial culture of value could be produced for use in the manufacture of satisfactory inoculants. (R. 48.) Such stock cultures are maintained at various universities and in the United States Department of Agriculture for

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[5]

Species	Cross-inoculation Group
Rhizobium trifolii	Red clover, crimson clover, mammoth clover, alsike clover
Rhizobium meliloti	Alfalfa, white and yellow sweet clovers
Rhizobium phaseoli	Garden beans
Rhizobium leguminosarum	Garden peas and vetch
Rhizobium lupini	Lupines
Rhizobium japonicum	Soy beans

distribution to the manufacturers of inoculants. (R. 198.) In addition, the manufacturers maintain their own stock cultures, some of which they have themselves isolated. (R. 198.)

The record shows that as early as 1907 and subsequently mixed inoculants in which there were a plurality of species of bacteria, were known and used,[6] as Bond admits. (R. 106.)

In 1916, Dr. Thomas F. Manns[7] and his assistant, Joseph M. Coheen, made an extensive investigation into the use of humus as a carrier for all beneficial legume bacteria, as well as a carrier for other plant fertilizers.[8] The conclusion of their work was that "in the light of recent investigations, the present work shows that the organisms for the different groups of the important agricultural legumes may be successfully carried in one and the same compost." (R. 532.)[9]

Also, mixed inoculants were on the market before the Bond invention in the form of packages of various size for use on garden beans, garden peas, lima beans, sweet peas and lupines, five cross-inoculation groups. In 1937 Mc-

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Petitioner's exhibits, Defendant below, are referred to herein as "DX...."; Respondent's exhibits, Plaintiff below, are referred to as "PX...."; and pages of the printed record as "R...."

[6] Mixed inoculants were known in prior patents and publications, DX-16, R. 508, R. 249; DX-17, R. 564, R. 256; DX-22, R. 636, R. 294; Patents to Earp-Thomas 865,965, R. 780; 1,099,121, R. 876; Manns 1,320,701, R. 804; and in commercial products DX-1, R. 440, R. 241; DX-4, R. 442, R. 241; DX-10, R. 476, R. 241; DX-11, R. 478, R. 241.

[7] Head of Department of Plant Pathology and Soil Bacteriology, University of Delaware, Delaware, N. J. (R. 244.)

[8] Bulletin No. 115, Delaware College Agricultural Experiment Station. (DX-16, R. 508-560, R. 249.)

[9] Additional excerpt from Defendant's Exhibit 16.

"Plate VII (R. 554)—Showing growth of five legumes, in sand culture, viz. alfalfa, crimson clover, vetch, cow peas and soy beans, representing as many different groups of B.radicicola. The amount of compost used was 2 lbs., 100 lbs., and 500 lbs. respectively. All showed strong inoculation indicating that in one compost all the groups may be successfully carried." (R. 547.)

Queen's, Inc., of Baltic, Ohio, placed on sale a ten-cent package of a mixed inoculant of the kind just referred to for use by home gardeners, and a market size package that was for inoculating ¼ bu. of seed for use by truck gardeners.[10] In fact, the method of producing the mixed inoculant at McQueen's is comparable to the method of preparing a mixed inoculant according to the Bond patent.[11] Also, Agricultural Laboratories, Inc., Columbus, Ohio, produced and sold a mixed inoculant following this same procedure before the advent of the Bond patent. (R. 168-171.)

There is no evidence of record in this case that would point to any reason why the early single inoculants or mixed inoculants were not satisfactory for the purpose for which they were used other than general difficulties in preparing and maintaining strong bacterial cultures.[12] In

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[10] Defendant's Exhibits 3 (R. 440, 241) and 4 (R. 442, 445, 241).

[11]

Bond's method of making a mixed inoculant.	McQueen's method of making a mixed inoculant.
1. Cultures several species of bacteria separately.	Cultures several species of bacteria in separate bottles. (R. 160, 162.)
2. Puts selected, "non-inhibitive" species together into a humus base.	Puts separately cultured bacteria together in a humus base. (R. 160.)
3. Humus base has "negligible concentration of nutrient."	Humus base had less nutrient in it than that of the Bond method. (R. 161.)
4. Puts the several bacteria in in numbers of "substantially the same order of magnitude."	Puts the several bacteria in in "substantially the same numbers for each of the different groups." (R. 166.)

[12] Plaintiff's Exhibit 13, Record 401, 68.

"Since 1903 the use of artificial cultures has developed rapidly. Unfortunately those in charge of the preparation of these cultures have not always made use of the scientific facts as laid down by the early workers in the field. The proper application of the scientific discoveries would no doubt have prevented much of the disappointment and loss from the use of poor cultures." (R. 401.)

fact, the record shows the contrary wherein the undisputed testimony of Dr. Hofer[13] is to the effect that a yield of lima beans produced from plants inoculated with a mixed culture was greater than when plants were inoculated with a single culture.[14] Dr. Lewis W. Erdman[15] testified that in the garden mixture of The Nitragin Co. (D.X. 11A and 11B, R. 479, 241) he uses the same strains of bacteria that are used in his single inoculant.[16] And that "we have been putting up this mixed culture for garden size for a period of years with very fine results." (R. 237.)

In these prior mixed inoculants the individual species of bacteria would act according to their own law of nature. Man did nothing to change their natural functioning, and man does nothing today, including Bond, to change the natural functioning of the bacteria in mixed inoculants. Those strains of bacteria which were strong in their ability to fix nitrogen would function efficiently and those that were weak would function inefficiently, each acting according to its own law of nature. Bond will not dispute this,

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[13] Assistant Professor, Cornell University, Bacteriologist, New York State Agricultural Experiment Station. (R. 312.)

[14] This is according to tests performed by Dr. Hofer, Defendant's Exhibit 31, R. 673, 317.

[15] Director of Research and Production, for The Nitragin Co., Milwaukee, Wisconsin. (R. 220.).

[16] Dr. Erdman testified as follows (R. 223):

"In preparing our garden culture, we will use the same material for our regular production of pea culture, for instance, that is used by the canners or the seed pea growers; the same selection of strains that goes to make up that also goes into the production of our garden culture. The same is true for our bean culture. The same is true for our lima bean culture and lupine culture. All of these are included in our garden mixture."

and in fact admits that the prior mixed inoculants could have contained his "alpha" [17] strains of bacteria.[18]

THE ALLEGED INVENTION OF BOND.

With this background, we can evaluate Bond's contribution and right to control and monopolize a law of nature.

The patentability of the Bond inoculant is said to reside in his alleged discovery that some strains of the legume bacteria have natural characteristics such that they will not be inhibited by other strains in their ability to fix nitrogen in the leguminous plants when placed together—a natural phenomenon or law of nature. As Bond says: "* * * said cultures being substantially unaffected by each other in respect to their ability to fix nitrogen in the leguminous plant for which they are specific." (Claim 1, R. 779.)

The reason for the alleged invention is, according to Bond, that prior to him "It has heretofore been considered impracticable to prepare a composite culture inoculant containing organisms which will cause nodulation on more than one of the cross-inoculation groups. This has not been done because it was generally believed that one species produced an inhibitory effect on another species within the same culture whereby symbiotic nitrogen fixation by the plant and the organism was inhibited or even prevented." [19]

Thus, Bond alleges that he made the discovery that of all of the numerous individual strains of bacteria that ex-

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[17] "Alpha" is the name given by Bond to the non-inhibitive strains of bacteria.

[18] Mr. Bond testified as follows on cross-examination:

"Q. It may have been given without showing the test that in this garden mixture there was what you now call an alpha strain of the bacteria?

A. There might have been. **There was no way to know, without running tests.**" (R. 133.)

[19] Bond patent, R. 774, line 70, column 1, to line 4, column 2.

ist in nature, some of them will not be inhibited in their ability to fix nitrogen by the presence of another in a base or carrier. Having made this discovery, Bond then proceeds in his patent to set forth a well-known test[20] to select his non-inhibitive or "alpha" strains by allowing them to act in their natural way on leguminous plants. Those strains of bacteria which, functioning according to the law of their nature, are not inhibited, are selected by Bond for use in an inoculant and have been named by him as "alpha" in the Bond patent. Those strains which, functioning according to the law of their nature, are inhibited, are discarded.

Thus, Bond permits the various strains of bacteria to work out their own destiny as intended by nature and

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[20] With reference to the test by which Bond selects a non-inhibitive strain of bacteria from an inhibitive strain, he testified as follows:

"Q. You selected the single strains which you propose to put in your mixture?

A. Yes.

Q. Now, you don't know whether that is an alpha strain or a non-alpha strain at that time, do you?

A. No.

Q. And you don't know any way of determining whether it is an alpha strain or a non-alpha strain except by subjecting it to a routine test.

A. Yes.

Q. Now, by an alpha strain I mean a strain as defined in your specifications, as one which has no inhibitory effect or is not affected by association with some other strain.

A. Yes.

Q. That is what we mean in the terms of your patent when referring to an alpha strain.

A. Yes.

Q. And this test that you subject your selected individual strains to, to determine whether they were alpha strains or not, was a routine, well known laboratory test.

A. Yes.

Q. The same as your efficiency test of a single strain, was it not?

A. Yes.

Q. You did not invent that test?

A. No, no." (R. 124.)

selects for use those strains which are not inhibited. **But, Bond admits the bacteria he selects are the same as found in nature, unchanged in any way.**[21]

The procedure in producing the alleged new product of Bond is as follows:

1. A species of bacteria is isolated from nature by a well-known laboratory technique that was known before the advent of the Bond patent. (R. 775, column 1, lines 17 to 22, R. 116.)

2. After the species of bacteria is isolated, it is cultured to cause it to multiply many times by laboratory technique known before the Bond patent (R. 115, 116), and which, as admitted by Bond, does not in any way modify or change the natural characteristics of the bacteria from that as it existed in nature. (R. 116.)

3. Standard routine tests, known in the art before the Bond patent (R. 116) are made to determine the efficiency of the particular species of bacteria in its ability to fix nitrogen. If it is an efficient specie, it is retained. If it is an inefficient specie, it is discarded.

4. This procedure of isolating and testing numerous individual strains of the several species of bacteria is followed until a plurality of efficient strains for each species of

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[21] Mr. Bond testified as follows:

"Q. When you get through with your culture you have the same bacteria you got from nature, but you have more of it, is that correct?

A. That is true; that is correct.

Q. And that was well-known in the art among those skilled in the art, prior to the date of your application for your patent or your claimed invention?

A. Yes, sir. (R. 116.)

Q. Therefore that means, does it not, that nothing that you have done to these bacteria brings about a state of inhibition or a state of non-inhibition.

A. No.

Q. **That is simply, then, the work of nature, and you apply tests to observe whether or not that physical fact of nature is in existence in these Rhizobia or is not in existence?**

A. **Yes.**" (R. 125.)

leguminous plant is found. This is an old testing procedure. (R. 116.)[22]

5. To make the "Bond" composite inoculant, the several efficient strains of each specie of the bacteria are then tested under standard technique known before the Bond patent (R. 124) to determine which of the strains of bacteria of each of the species is the most effective when the several species are mixed together.[23] If the bacteria in the inoculant that contains two or more independent species function in exactly the same way they do in nature working by themselves, then this particular strain of bacteria is selected by Bond as the "alpha" strain for use in his composite inoculant. (R. 777, column 1, line 36.)

6. One or more of the "alpha" strains are then used in the composite inoculant.

Bond admits that he isolates the various strains of bacteria by technique old before his patent. (R. 775, column 1, lines 17 to 24.) He admits that he cultures the bacteria by standard technique (R. 115, 116) and he admits that he does not change the material characteristics of the bacteria. (R. 116 and 125.) He admits his efficiency testing of the strains is standard practice known before his invention. (R. 116.) He admits the humus was no invention of his and that his method of placing the bacteria in the humus was no claimed invention of his. (R. 119.) He admits the

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[22] The Bond patent also states:

"* * * a number of strains of each of these organisms may be isolated from nature by any of the approved methods such as have been described in the above referred to Laboratory Manual of General Microbiology by Fred and Waksman." (R. 777.)

[23] The method of testing is an old procedure as stated in the Bond patent:

"The method for carrying out tests for determining the amount of nitrogen fixed by leguminous plants in association with the various species of the Rhizobia are well known in the art and are given in detail by Fred and Waksman, *supra*, and Fred, Baldwin and McCoy." (R. 777.)

test for his "alpha" strains was a well-known laboratory test. (R. 124.) **He admits that nothing he does to the bacteria brings about a state of inhibition or non-inhibition. It is simply a work of nature.** (R. 125.)[24]

THE ESSENCE OF THE BOND INVENTION.

The heart of the Bond invention thus rests upon his alleged discovery that non-inhibitive legume bacteria exist in nature and can be selected for use. Even these, however, follow their natural functions without any change by Bond. (R. 125.)

This contention of Bond was built upon a collection of more or less casual statements made by various writers prior to 1937[25] (the date at which Bond alleges to have made a study of the literature) (R. 54), and on tests allegedly made by him, but which were never substantiated or corroborated by any evidence introduced at the trial. Some of these tests are set forth in his patent (R. 778), but even here it was shown at the trial that his reported findings were not accurate. (R. 130.)

The alleged inhibitory effect is said to manifest itself in a lowering of the efficiency of the bacteria to fix nitrogen in the plants when the bacteria are used together in a common base as shown by a lesser amount of nitrogen in the plants upon making a chemical analysis of them.[26] Re-

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[24] See footnote 21, page 11, *supra*.

[25] The statements made by the various writers were either refuted or explained by Petitioner's witnesses, which were in several instances the authors of the statements.

[26] Bond sets forth the criterion in his patent as follows:

"One criterion by which the alpha strains of the organisms may be determined is based on a statistical comparison of the total milligrams of nitrogen fixed in plants previously inoculated with a single strain unmixed with strains of other species with the total milligrams fixed in plants inoculated with the same strain mixed with strains of other species." (R. 777.)

"• • • samples were analyzed by the Kjeldahl method for their nitrogen content." (R. 778.)

spondent's witness, Dr. Robert H. Burris,[27] testified that the Kjeldahl chemical examination is the only valid method of determining nitrogen content,[28] yet the Kronenberger article[29] so largely depended on by Respondent to support its contention of inhibition does not show any chemical analysis. Kronenberger's report is based entirely on a visual inspection of the general condition of the plants during growth and dry weight of the plants, which method of analysis and inspection was vigorously attacked by Respondent when these same kinds of tests were applied to show satisfactory results obtained by mixed cultures of the prior art.[30]

Further, Dr. Hofer's tests introduced at the trial[31] are in direct conflict with the Kronenberger article for the reason that Dr. Hofer did not find any inhibition where Kronenberger apparently did, even though Dr. Hofer prepared his inoculant by the same method that Kronenbereger prepared his,[32] and Dr. Hofer even made a chemical analysis of the nitrogen content of his plants. (R. 306 to 308.)

Contrary to the contention of Bond that one strain of bacteria inhibits another, Petitioner introduced evi-

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[27] Assistant Professor in Biochemistry, University of Wisconsin, Madison, Wisconsin.

[28] Record 346.

[29] "On Mutual Retardation and Favoring Between Nodule Bacteria." By Max Kronenberger; Bavarian Agricultural Institute for Plant Culture and Plant Protection, Munich, Germany. (P.X. 11, R. 383, R. 68.)

[30] Testimony of Ivan H. Curie, R. 201, 203, 210, 219.
Testimony of Dr. Lewis W. Erdman, R. 232.
Testimony of Lewis T. Leonard, R. 298.
Testimony of Dr. Alvin W. Hofer, R. 333.

[31] D.X. 26, R. 665, 306; D.X. 27, R. 667, 306; D.X. 28, R. 669, 306; D.X. 29, R. 670-671, 309.

[32] Dr. Hofer's method of preparing his inoculant is set forth in the record, page 304.
Kronenberger's method of preparing his inoculant is set forth in the record, page 385.

dence at the trial through its experts, I. H. Curie, L. W. Erdman and A. W. Hofer, of the results of tests that show the incorrectness of any contention that normally and generally one strain of bacteria is inhibited when it is placed in association with another strain of bacteria of another cross-inoculation group. Even assuming that Bond's discovery of the existence of inhibitive and non-inhibitive strains of bacteria is correct, the results of all tests introduced by the Petitioner show that inhibition, if it exists, is an exception,—not the rule, as alleged by Respondent and Bond.

Petitioner's position is this: It makes no difference whether Bond discovered inhibition or not. It makes no difference if it was new. It is still a law of nature, used without modification or creation of an art, machine, manufacture or composition of matter. It is, therefore, not invention.

HOLDING OF THE COURTS BELOW.

On the foregoing state of the facts the District Court held the claims in suit "invalid under our Patent Statute because they do not involve the invention or discovery of 'any new and useful art, machine, manufacture or composition of matter.'" (R. 744.)

The Circuit Court of Appeals for the Seventh Circuit in reversing the holding of the District Court assumed that when Bond discovered, if he did, the non-inhibitive strains of bacteria, that he made an invention, that Court stating (R. 824):

> "* * * the discovery of a natural phenomenon or of a quality or attribute of a well known article and application of that quality in a successful combination which is of value to mankind, is entitled to patent protection."

the Court following the dicta set forth in its prior decision in *Dennis et al. v. Pitner et al.*, ~~146~~ 106 F. (2d) 142.

THE ERRORS ASSIGNED AND TO BE ARGUED.

The errors assigned in the Petition for Writ of Certiorari and to be argued here are:

I. No Patent can be sustained for monopoly of a law of nature of a product or composition of matter.

II. Can the discoveries of the law of nature of natural products or composition of matter, without further contribution by the discoverer, be the subject of patent monopoly under the Statutes R. S. 4886 or do they belong to the public?

III. An old product or products of nature in combination cannot be patented by a mere discovery of a new quality existent in nature from time immemorial: Under Sec. R. S. 4886 to be patentable, the combination must be new and useful and based upon a contribution to the public not existing in nature.

IV. A product claim that relies for its novelty upon a statement of function is invalid.

V. Public Importance.

SUMMARY OF ARGUMENT.

The laws and phenomena of nature are a part of the tools of science that have not been brought within the field of protection of the patent law by statute or by interpretation of statute. These tools are a part of our storehouse of knowledge which shall remain free for all eternity for use by men in their continued efforts to reach a higher plane of living and endeavor. To cut short the future use of new discoveries of the laws or phenomena of nature, or of new qualities or attributes of products of nature, or old products, by awarding private patent monopolies on such discoveries will discourage arts and manufactures, against the avowed policy of the patent laws.

It makes no difference whether or not Bond was the first to discover previously unknown attributes of the legume bacteria and thus show that non-inhibitive strains of bacteria exist in nature. The use of these discovered at-

tributes is not patentable, for invention is not in the discovery of them. Here Bond does not control the bacteria, but to the contrary, he allows the bacteria to act according to their own law of nature and thus work out their own destiny as to their future use by him.

Mixed inoculants were known long before the Bond patent and all scientists in the art of legume bacteriology were constantly carrying forward the art for improvement. But, the mere carrying forward of an original thought, the mixed inoculant, a change in form, proportions, or degree, the substitution of equivalents, doing substantially the same thing in substantially the same way by substantially the same means with better results, is not invention as will sustain a patent.

The only way Bond can determine the existence of inhibitive or non-inhibitive strains of bacteria is to perform tests. No one can know whether he is or is not an infringer of the Bond Patent without performing tests, and even then may not know for tests are variable. But a patentee has no right to cause others to perform tests to determine the scope of his claims.

The patent statute R. S. 4886 requires that the subject of a patent shall be an "invention or discovery," shall be "new and useful" and shall be an "art, machine, manufacture, or composition of matter." When all of the criteria do not exist a patent cannot issue. The subject of the Bond Patent is not classifiable in the required classifications of the statute and even though the discovery of the phenomena of nature may be new, it merely displays itself in an old mixed inoculant. The patent statute is, therefore, not satisfied. The mere fact that an article is new commercially does not make it new patentably.

However skillfully Bond brought the non-inhibitive bacteria together in the old mixed inoculant, it was still the product of skill, not of invention. The non-inhibitive bac-

teria function in his product in the same way they have functioned in nature from time immemorial, either individually or when in association with other legume bacteria that exist in nature, with the inevitable result of fixing nitrogen in leguminous plants according to their own law of nature, unchanged, unmodified in anyway by Bond. It would be unsound to hold that merely because the manufacturers of mixed inoculants prior to Bond did not know they had inhibitive and non-inhibitive strains of bacteria in their product, they would now be infringers after Bond discovered the existence of non-inhibitive bacteria.

Further, to practice the Bond invention requires testing and mathematical calculations based upon those tests and the mental determination and analysis of the calculations before the existence or non-existence of the non-inhibitive strains of bacteria can be established, if it exists. Even then, this determination would be based on the experimenter's own calculations made as a result of the degree of skill that he was capable of employing. A skillful operator might find non-inhibition, an unskillful one would not. Such indeterminate determinations make the practice of the Bond invention incapable of clear definition as required by the patent statute (R. S. § 4888). The subject of the Bond Patent is defined only in terms of effect or function of the elements of the product.

This case is of great public interest in an age where our national security and prosperity are dependent upon the free use of scientific discoveries to promote our welfare. The public interest demands that there be no private monopoly of such results of scientific discovery, where the discovery merely unfolds the secrets of nature, previously hidden in the darkness of insufficient knowledge, but which, upon discovery, can be made a working tool of science for future progress. To deny this is to retard progress made possible by the skill of the scientist.

ARGUMENT.

I. NO PATENT CAN BE SUSTAINED FOR MONOPOLY OF A LAW OF NATURE OF A PRODUCT OR COMPOSITION OF MATTER.

The Bond Patent claims a monopoly of any inoculant containing bacteria of more than one of the cross-inoculation groups in which one or more strains of the bacteria are of a non-inhibitive kind.[33] It makes no difference whether the bacteria, functioning according to their own law of nature, are merely not inhibited when put in association with one another or whether they function better when placed in association with one another,—the Bond claims monopolize the use of bacteria in an inoculant so long as the bacteria is "unaffected by the others in respect to its ability to fix nitrogen in the leguminous plant."[33]

This monopoly of a mixed inoculant is urged by the Respondent regardless of the manner in which the inoculant is made. Bond endeavors to remove from the field of use by the inoculant industry any and all non-inhibitive strains of bacteria for use in mixed inoculants regardless of when the bacteria was discovered and regardless of how old the particular strain of bacteria may be, thus requiring any manufacturer of any mixed inoculant to scientifically test all of his strains of bacteria that he now holds as stock cultures to be sure that he uses only inhibitive strains when making a mixed inoculant, and if he has no inhibitive strains, to go out and find them.

The only basis for this monopoly is that Bond alleges that he discovered a previously unknown phenomenon of nature, that non-inhibitive strains of bacteria do exist,

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[33] Claim 5 illustrates the extreme breadth of the Bond Patent.

"An inoculant for leguminous plants comprising a plurality of strains of different species of bacteria of the genus Rhizobium, at least one of which strains is unaffected by the others in respect to its ability to fix nitrogen in the leguminous plant for which it is specific." (R. 779.)

whereas he claims, previously, it had been thought that the bacteria were inhibitive.

On the contrary, the evidence produced by the Petitioner at the trial concerning the question of whether or not inhibitive strains exist, clearly shows that when highly efficient strains of bacteria are merely mixed together in a common carrier or base, that under normal circumstances, with the bacteria acting according to their own law of nature, there will not be any inhibitory effect of one strain of bacteria with reference to another. And Bonds admits that manufacturers of inoculants use only highly efficient strains of bacteria,—there would be no sense in doing otherwise.[34]

This alleged discovery of Bond is no more than another discovery of a phenomenon of nature which exists as a part of our storehouse of knowledge, dormant, until some researcher delves into the intricate secrets of nature. Morton did this at the time of his discovery of the phenomenon of anaesthesia on the human body under the effect of ether. However, this discovery was held not patentable in *Morton v. New York Eye Infirmary* (C. C. N. Y. 1862), Fed. Cas. 9865, 17 Fed. Cas. 879, 881.

> "* * * In its naked ordinary sense, a discovery is not patentable. A discovery of a new principle, force, or law operating, or which can be made to operate, on matter, will not entitle the discoverer to a patent. It is only where the explorer has gone beyond the mere

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[34] Mr. Bond testified as follows:

"A. That is true, occasionally, there is a strain found that is not constant. That is, its nitrogen fixing ability may drop. But strains of that nature is the exception rather than the rule.

Q. But there are such strains?

A. They do exist. When the strain is observed to vary in that manner, it is not used in making a commercial product." (R. 120.)

"A. That is true, they are selected first, because there is no sense of even thinking of putting a culture in a product that isn't good in the first place." (R. 123-124.)

domain of discovery, and has laid hold of the new principle, force, or law, and connected it with some particular medium or mechanical contrivance by which, or through which, it acts on the material world, that he can secure the exclusive control of it under the patent laws. He then controls his discovery through the means by which he has brought it into practical action, or their equivalent, and only through them. It is then an invention, although it embraces a discovery. * * *"

Imagine the effect on human welfare and the restriction that would have been placed on the advancement of medical science if the discovery of the anaesthetic effect of ether when applied to the human body, would have been declared the subject of a valid patent. We submit the same far-reaching effect is now at stake in this case for in the last few years it is the common practice for farmers to seed their fields with a mixed seeding of clover and alfalfa.

If this alleged discovery of Bond is allowed to remain as a valid patent, it will stop all further progress in the bacteriological art as applied to the Rhizobium bacteria for use in agriculture. No manufacturer could put himself in the position of placing two or more species of bacteria together in a common carrier to inoculate any mixed seeding of any kind for fear of infringing the Bond patent. This, regardless of the fact that the species of bacteria the manufacturer placed together had been known to him and used by him with highly successful results for many years before the advent of the Bond patent, and regardless of the method by which he put these bacteria together.

Bond endeavors to monopolize an entire industry by a mere discovery of the law of the nature of the functioning of bacteria over which he has no control.

Bond does not claim that he discovered any new kind of bacteria, nor does he claim that he discovered any new principle by which the bacteria work. He does not claim that his method of culturing the bacteria is new, nor does he claim that his use of a humus base is new. Bond does

not claim that he has a product that was unknown before his patent, for mixed cultures were admittedly used before Bond. (R. 106.)

Bond does not claim that the bacteria work in any different way in his culture than they do in nature nor than they have worked in previous mixed cultures. He does not claim that they work other than according to their own law of nature. He admits that nothing that he has done makes any change in the way the bacteria work according to their own law of nature. (R. 125.) If the bacteria are of the inhibitive kind they will be inhibited; if they are not of that kind they will not be inhibited. **This is a natural function of the bacteria and nothing Bond does changes it.**

All that Bond can lay claim to is that in his mixed inoculant he takes advantage of the natural characteristics of certain strains of bacteria to make his mixed culture more efficient than the previous mixed cultures; and even he is doubtful of this fact for he admits that the mixed cultures of the prior art could have contained his non-inhibitive strains of bacteria. (R. 133.)[35]

Assuming for the purpose of argument that Bond did discover the fact that certain strains of bacteria, when acting according to the law of their nature, will not be inhibited when placed in association with other strains of bacteria from other cross-inoculation groups, this is merely a discovery of a scientific fact that has always existed or of a quality of the bacteria that had not previously been discovered by scientists. A newly discovered principle or quality of the bacteria or the manner in which they work in nature, is not patentable. As this Court has held in *LeRoy et al. v. Tatham et al.*, 14 How. 156, 175, 14 L. Ed. 367:

> "A patent is not good for an effect, or the result of a certain process, as that would prohibit all other persons from making the same thing by any means what-

[35] See footnote 18, page 9.

soever. This, by creating monopolies, would discourage arts and manufactures, against the avowed policy of the patent laws."

And this Court, in *O'Reilly, et al. v. Morse, et al.*, 15 How. 62, 117, 14 L. Ed. 601, when referring to its decision in the prior case of *LeRoy et al. v. Tatham et al., supra*, said:

> "It appeared that, in that case, the patentee had discovered that lead, recently set, would, under heat and pressure in a close vessel, reunite perfectly, after a separation of its parts, so as to make wrought instead of cast pipe. And the court held that he was not entitled to a patent for this newly-discovered principle or quality in lead; and that such a discovery was not patentable. * * *"

The discovery of the natural functioning of the bacteria is the only thread of alleged invention in the Bond patent. Even if this were new, the mere application of this discovery to the old mixed inoculant product without in any way changing the manner in which that old product functioned, except possibly in degree, is not invention. As this Court said in *LeRoy et al. v. Tatham et al., supra*:

> "* * * It is said, in the case of *The Househill Company v. Neilson*, Webster's Patent Cases, 683; 'A patent will be good, though the subject of the patent consists in the discovery of a great, general, and most comprehensive principle in science or law of nature, if that principle is by the specification applied to any special purpose, so as thereby to effectuate a practical result and benefit *not previously attained*.' * * *." (p. 175—emphasis ours.)

The issue here is—is such a discovery patentable when the patentee does nothing to change the natural characteristics of the bacteria, adds nothing to nor takes anything away from the bacteria, but merely uses the bacteria as selected by their own law of nature for use in an old and well-known product to produce the same and well-known function?

To allow such a discovery to now become the subject of a patent monopoly, as held by the Circuit Court of Appeals, is in direct conflict with the holding of this Court in *LeRoy et al. v. Tatham et al.*, 14 How. 156, 175, 14 L. Ed. 367:

> "* * * A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right * * *
>
> "* * * In all such cases, the processes used to extract, modify and concentrate natural agencies, constitute the invention. The elements of the power exist; the **invention is not in discovering them, but in applying them to useful objects.** * * *" (Emphasis ours.)

In the *Telephone* cases, 126 U. S. 1, 532, 8 S. Ct. 778, 31 L. Ed. 863, it was the "new" and useful result, such as using a current from a battery in a particular type of circuit so that one puts a force of nature in a specific condition that is "new," which was patentable.

> "In this art—or, what is the same thing under the patent law, this process, this way of transmitting speech—electricity, one of the forces of nature, is employed; but electricity, left to itself, will not do what is wanted. **The art consists in so controlling the force as to make it accomplish the purpose.** * * *" (Emphasis ours.).

In *Smith v. Nichols*, 21 Wall. 112, 119, 88 U. S. 112, 22 L. Ed. 566, this Court said that—

> "* * * a mere carrying forward or new or more extended application of the original thought, a change only in form, proportions, or degree, the substitution of equivalents, doing substantially the same thing in the same way by substantially the same means with better results, *is not such invention as will sustain a patent.*" (Emphasis ours.)

The holding of the Circuit Court is in direct conflict with the holding of this Court in *DeForest Radio Co. v.*

General Electric Co., 283 U. S. 664, 684, 685, 51 S. Ct. 563, 75 L. Ed. 1339, wherein this Court stated:

"* * * It is method and device which may be patented and not the scientific explanation of their operation. See *LeRoy v. Tatham*, 14 How. 156, 174-6."

In *Burr v. Duryee*, 1 Wall. 531, 570, 17 L. Ed. 650, this Court stated:

"* * * We find here no authority to grant a patent for a 'principle' or a 'mode of operation,' or an *idea*, or any other abstraction. * * *"

But Bond does not make any change in or modify the bacteria used in his product and did not create a substance which never existed, for mixed inoculants were old. All that Bond can say is that his substance is more efficient than the old substance. That was not the case in *Union Carbide Co. v. American Carbide Co.* (C. C. A. 2), 181 Fed. 104, 105, relied upon by the Circuit Court in support of the Bond invention, for there the patent was upheld for the reason that the patentee had created something that had never existed before.

"It appears that calcium carbide under different conditions takes both the crystalline and the amorphous forms. The specification itself states, as we have seen, that the substance had existed in an amorphous form prior to the invention, and *the patent relates solely to the crystalline form* * * *" (Emphasis ours.)

That was also true in the case of *J. E. Baker Company v. Kennedy Refractories Company et al.* (C. C. A. 3), 253 Fed. 739, 741, relied upon by the Circuit Court.

"* * * By the apparently simple expedient of double burning, *the patentee got a product chemically and commercially unlike any dolomite product theretofore known*, which the metallurgical art, notwithstanding the predominating lime base of the product, accepted at once as the equal of and a fair substitute for Austrian magnesite with its magnesia base. * * *" (Emphasis ours.)

In *General Electric Co. v. DeForest Radio Co. et al.* (C. C. A. 3), 28 Fed. (2d) 641, 643, the question was whether a natural element "tungsten" could be the subject of a patent. In holding the patent invalid the Court stated:

> "Naturally we inquire who created pure tungsten. Coolidge? No. It existed in nature and doubtless has existed there for centuries. The fact that no one before Coolidge found it there does not negative its origin or existence. * * *
>
> "* * * it is now conceded that tungsten pure is ductile cold. If it possesses that quality now it is certain that it possessed it always. Therefore the second part of the claim is merely a correct description of the first part and the first part broadly claims as an invention a product of nature in the form of a chemical element for which a product claim as distinguished from a process claim cannot be validly awarded."

Bond admits that he makes no change in the natural inherent characteristics and functioning of the bacteria. (R. 116.) Therefore he had made no patentable invention.

Even assuming Bond's discovery to be new, the Court, in *Universal Winding Co. v. Foster Machine Company*, 16 F. Supp. 671, 677 (D. C. Mass.), affirmed (C. C. A. 1) 90 F. (2d) 472, stated:

> "* * * The discovery that a law of nature will produce a desired result, apart from any novelty in the means by which that law is brought into operation, is not patentable. *Magin v. Karle*, 150 U. S. 387, 392, 14 S. Ct. 153, 37 L. Ed. 1118; *Knapp v. Morss*, 150 U. S. 221, 228, 14 S. Ct. 81, 37 L. Ed. 1059. See, also, *Risdon Iron & Locomotive Works v. Medart*, 158 U. S. 68, 15 S. Ct. 745, 39 L. Ed. 899."

Bond does not go beyond "mere domain of discovery." He merely selects the best of the bacteria that he can find in nature by a series of old test selections and segregates those that most beneficially perform their natural function of fixing nitrogen in the leguminous plants and includes them in his composite inoculant.

Novocol Chemical Manufacturing Co., Inc. v. Powers & Anderson Dental Company (C. C. A. 4), 128 F. (2d) 904, 907:

> "There was no invention in conducting routine tests to prove or disprove the existence of a physical fact. Patents may be issued for arts, machines, manufactures and compositions of matter, 35 U. S. C. A. § 31. But the laws of nature and their workings are not the subject of invention by man. He may discover them and bring them to the knowledge of the world but he cannot patent that discovery; he can obtain a patent only when he has invented an art or a machine whereby to utilize his discovery. *O'Reilly v. Morse* (involving invention of the telegraph) 15 How. 62, 112; 14 L. Ed. 601; *Walker on Patents*, 6th Ed., Sect. 18."

The Subject of the Bond Patent is Not Within the Classifications of R. S. 4886.

Regardless of whether the alleged discovery of Bond is new, the subject of the Bond Patent is not an art, machine, manufacture or composition of matter within the purview of the statute.

Admittedly the subject of the Bond Patent is not an art, or a machine. Neither is it a manufacture as defined by this Court in *American Fruit Growers, Inc. v. Brogdex Company*, 283 U. S. 1, 11, 51 S. Ct., 328, 75 L. Ed., 801 for there the court said:

> "'Manufacture,' as well defined by the Century Dictionary is 'the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.' Also 'anything made for use from raw or prepared materials.'".

Further, the subject of the Bond Patent is not a true composition of matter for each species of bacteria in the inoculant of the patent work by their own law of nature completely independently of any other species in the inoculant, just as though it were not there. In a true com-

position of matter each element loses its identity to give properties to the composition the individual elements do not possess, as stated in *P. E. Sharpless Co. v. Crawford Farms*, 287 Fed. 655, 658 (C. C. A. 2):

> "* * * A patentable composition of matter may well result or be formed by the intermixture of two or more ingredients, which develop a different or additional property or properties which the several ingredients individually do not possess in common. * * *"

II. CAN THE DISCOVERIES OF THE LAWS OF NATURE AND OF NATURAL PRODUCTS, WITHOUT FURTHER CONTRIBUTION BY THE DISCOVERER, BE THE SUBJECT OF PATENT MONOPOLY UNDER THE PATENT STATUTE R. S. 4886, OR DO THEY BELONG TO THE PUBLIC?

The Circuit Court of Appeals based its decision on the finding of the District Court that Bond "discovered the fact that among the bacteria found widely spread in nature there existed both mutually inhibitive and mutually non-inhibitive strains which can be selected and isolated and when so selected and isolated perform the same function that they do in nature." (Finding 12, R. 749.) The Circuit Court went on to say that on the basis of this teaching they thought that Bond had made an invention.[36]

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[36] Quotations from Decision of Circuit Court:

"His teaching was that he could, by conventional tests, delete the inhibitive strains and retain the non-inhibitive ones and that these, when combined, could be put into a composite inoculant where the same desirable results could be achieved by each appropriate species of bacteria as would be accomplished if only a single species of bacteria were included in the inoculant. *Upon this we think the question of invention hinges.* * * *" (R. 820.) (Emphasis ours.)

"* * * However, he [District Court] made a specific finding that Bond did discover that there exist in nature non-inhibitive strains and that these non-inhibitive strains may be selected, isolated and combined and still perform satisfactorily

(Continued on following page)

When the Circuit Court in the critical statement of its decision held

> "* * * the discovery of a natural phenomenon or of a quality or attribute of a well known article and application of that quality in a successful combination which is of value to mankind, is entitled to patent protection."

it raised a fundamental question as to the interpretation of R. S. 4886 as applied to the patentability of a discovery of a phenomenon of nature or elements of nature, when the discoverer does nothing but use the natural phenomenon or element in its natural form for the purpose it performs in nature, in the same old way.

This statement of the Circuit Court of Appeals does not take into account the fact that the Patent Statute (R. S. 4886) requires that an invention or discovery shall be "new" as well as "useful." It makes no difference how useful a device or a product may be, or how revolutionary its character may be, *if it is not new* as well as useful it fails to meet the patent statute. This Court has said in *Cuno Engineering Corporation v. Automatic Devices Corporation*, 314 U. S. 84, 90, 62 S. Ct. 37, 86 L. Ed. 58:

> "* * * Under the statute (35 U. S. C. § 31; R. S. § 4886) the device must not only be 'new and useful,' it must also be an 'invention' or 'discovery.' *Thompson v. Boisselier*, 114 U. S. 1, 11. * * *"

The corollary of this is, to make a device patentable it must not only be an invention or a discovery, it must be "*new*" and useful. That which has existed as a funda-

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(*Continued from preceding page*)

their ordinary desirable functions. Upon this finding there was controverted evidence, but our examination of the record is convincing that that supporting the findin ; is rather conclusive and that there is no justification for us to declare the District Court in error in making it. Consequently the specific question which now confronts us is whether, upon the finding of fact, the court erred in concluding that, under the law, Bond made nothing patentable." (R. 820.)

mental law of nature in the storehouse of knowledge yet undiscovered, but which existed from time immemorial, is not "new."

The bacteria, either as inhibitive or non-inhibitive kind, have existed in nature and have acted according to their own law of nature long before any invention of Bond. His only contribution is in discovering, if it was a discovery, the existence of the legume bacteria, which, acting according to their law of nature, will not be inhibited by another when placed in association in a humus base or carrier.

Bearing in mind that mixed inoculants "*per se*" were not new at the time of the Bond invention, and that all that Bond did was to discover by conventional tests of the existence in nature of both inhibitive and non-inhibitive bacteria, the mistake of the Circuit Court lay, we think, in attributing to the "discovery" the status of invention within the meaning of the Patent Statute (R. S. 4886).

Even assuming that Bond was the first to make a "commercially successful" mixed inoculant, a thing may be new in the sense that it is placed on the market for the first time, but that does not make it new in the patentable sense. This, we think, is where the Circuit Court incorrectly applied the alleged newness of the Bond discovery. Mr. Justice Clifford, in *Collar Co. v. Van Dusen*, 23 Wall. 530, 563, 23 L. Ed. 128, clearly set forth this distinction when he said:

> "Articles of manufacture may be new in the commercial sense when they are not new in the sense of the patent law. New articles of commerce are not patentable as new manufactures, unless it appears in the given case that the production of the new article involved the exercise of invention or discovery beyond what was necessary to construct the apparatus for its manufacture or production."*

"* *Glue Company v. Upton*, 6 Official Gazette, 840."

"Nothing short of invention or discovery will support a patent for a manufacture any more than for an art, machine, or composition of matter, for which proposition there is abundant authority in the decisions of this Court.†"

"† *Hotchkiss v. Greenwood*, 11 How. 265, *Phillips v. Page*, 24 How. 167; *Jones v. Morehead*, 1 Wall. 162; *Stimpson v. Woodman*, 10 Wall. 121.

See also:

Dunbar v. Meyers, 94 U. S. 187, 196, 197, 24 L. Ed. 34; *Roemer v. Simon*, 95 U. S. 214, 217, 218, 24 L. Ed. 384."

In *Boston Pencil Pointer Co. v. Automatic Pencil Sharpener Co.* (C. C. A. 2) 276 Fed. 910, 912, the Court said:

"Further, it is settled that articles may be new in a commercial sense, when they are not new in the sense of the patent law (*Collar Co. v. Van Dusen*, 23 Wall. 530, 23 L. Ed. 128), and novelty, however great, can never be put in the place of invention (*Robins v. Link Belt*, 233 Fed. 1005, 148 C. C. A. 15). * * *"

Hence, novelty, utility or commercial success alone will not sustain invention. There must be invention to begin with.

This Court, in *Mackay Radio & Telegraph Co. v. Radio Corporation of America*, 306 U. S. 86, 94, 59 S. Ct. 427, 83 L. Ed. 506, said:

"While a scientific truth, or the mathematical expression of it, is not patentable invention, a *novel* and useful *structure* created with the aid of knowledge of scientific truth may be. * * *" (Emphasis ours.)

We would here call the attention of this Court to the fact that only a "novel structure" created by the patentee with the aid of a scientific truth, is patentable. Bond does not create a "novel structure," for the mixed inoculant was known before him. The bacteria used by Bond are no different from those found in nature or from those which could, may or did exist in the prior mixed inoculants. The base of the inoculant is no different nor is there any differ-

ence in the creation of the large numbers of the bacteria for incorporation in the base.

The only contribution of Bond is that of a scientific discovery by which he determines the natural functioning of the bacteria and then, without any change, he uses the non-inhibitive kind of bacteria.

It should be noted that the attribute of invention is given by the Circuit Court to the discovery of a natural phenomenon without regard to whether there is a "new" structure created by the patentee. The "newness," if any, is in the discovery of the natural phenomenon, not in the product, for mixed inoculants were old at the time of the Bond patent.

Thus, the Circuit Court places the attribute of invention upon its "value to mankind." R. S. 4886 requires that there be a "new and useful art, machine, manufacture or composition of matter" before a patent be awarded to an inventor.

This decision of the Circuit Court of Appeals would avoid the requirement of the patent statute and would put in its place the rule that a discovery of a natural phenomenon applied to a successful combination which is of value to mankind, establishes invention. *This, we think, is a matter for Congress to decide.*

III. AN OLD PRODUCT OR PRODUCTS OF NATURE IN COMBINATION CANNOT BE PATENTED BY A MERE DISCOVERY OF A NEW QUALITY EXISTING IN NATURE. UNDER SEC. R. S. 4886 A COMBINATION TO BE PATENTABLE MUST BE BOTH NEW AND USEFUL AND BASED UPON A CONTRIBUTION TO THE PUBLIC NOT EXISTING IN NATURE.

Bond does not dispute the fact that before his invention mixed inoculants were known and used for inoculating leguminous plants of a plurality of cross-inoculation groups. Neither will he dispute the fact that when these prior mixed inoculants were used they effected the desired result of inoculating the various leguminous plants on which they were intended to be used and that nitrogen was fixed by the plants. His only disagreement with the prior art is that the prior mixed inoculants did not work as efficiently as they might have.

Bond cannot dispute the fact that before his patent legume bacteria that were highly efficient in their ability to fix nitrogen in the leguminous plants were known and used by many manufacturers.[37]

In the case before us, the mixed inoculant "*per se*" is not new, no new kind of bacteria have been discovered that did not exist in nature before the Bond patent, no new method of propagating the bacteria is disclosed, no new humus base is used, nor is there any new method of putting the bacteria in the humus base disclosed in the Bond patent. All of these were well known before the Bond patent and the only thing that Bond contributed to the art, if anything, is the idea of using non-inhibitive strains of bacteria in a mixed inoculant of the same kind known previously in the prior art.

Now, it may very well be that by using only non-inhibitive strains of bacteria in an inoculant instead of some strains that might be inhibitive, a commercial product

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[37] See footnote 34, page 20.

is produced that is better to a degree than those of the prior art, but this does not result from any new mechanical arrangement of the elements of the composition, but from the fact that the material of which the inoculant is composed happens to be better adapted to the purpose for which it was made. Any improvement therefore is in the use of the superior strains of bacteria, which "*per se*" are not new, having existed in nature from time immemorial. But as this Court said in *Hotchkiss v. Greenwood*, 11 How. 248, 266; 13 L. Ed. 683:

> "But this, of itself, can never be the subject of a patent. No one will pretend that a machine made, in whole or in part, of materials better adapted to the purpose for which it is used than the materials of which the old one is constructed, and for that reason better and cheaper, can be distinguished from the old one, or, in the sense of the patent law, can entitle the manufacturer to a patent."

Each strain of bacteria performs, in the mixed inoculant, exactly the same function that it produces in nature unlimited, unchanged, unmodified in any way by the Bond patent. "Each served as separately it had done." *Toledo Pressed Steel Co. v. Standard Parts, Inc.*, 307 U. S. 350, 356, 59 S. Ct. 897, 83 L. Ed. 1334.

Bond in his patent has simply set forth an old testing technique which is useful in the manufacture of mixed inoculants under modern methods. That technique involves the act of selecting non-inhibitive from inhibitive bacteria and then using the bacteria in the mixed inoculant to allow them to produce their normal, natural function in the same way in which they do in nature. Even assuming that Bond is the first to discover the non-inhibitive bacteria, "the law does not protect the act of selection *per se*, however meritorious, when it is not materially incorporated into some new physical object." *Old Town Ribbon & Carbon Company, Inc. v. Columbia Ribbon and Carbon Mfg. Co.* (C. C. A. 2), 159 F. (2d) 379, 382.

Bond's physical object, the mixed inoculant, was not new "*per se.*" Bond had an idea, but an idea of itself is not patentable. The idea might have been a good one, "but his device, to give it effect, though useful, was not new." *Rubber Tip Pencil Company v. Howard*, 20 Wall. (87 U. S.) 498, 507, 22 L. Ed. 410. In *DeForest Radio Co. v. General Electric Co.*, 283 U. S. 664, 684, 685, 51 S. Ct. 563, 75 L. Ed. 1339, this Court stated:

> "• • • It is method and device which may be patented and not the scientific explanation of their operation. See *LeRoy v. Tatham*, 14 How. 156, 174-6."

However skillfully Bond brought the non-inhibitive bacteria together, and even though there was produced a commercial inoculant that was more efficient than the commercial inoculants of the prior art, "it was still the product of skill, not of invention." *Altoona Public Theatres, Inc. v. American Tri-Ergon Corp. et al.*, 294 U. S. 477, 486, 55 S. Ct. 455, 79 L. Ed. 1005.

The non-inhibitive strains of bacteria, which Bond says he discovered exist in nature, have functioned according to their law of nature from long before the Bond patent with the inevitable result of fixing nitrogen in the leguminous plants.

When these bacteria are placed in a mixed inoculant, and Bond admits that they could have been placed in the mixed inoculants of the prior art (R. 133), they would produce their inevitable result of fixing nitrogen according to their own law of nature, and nothing that Bond has done in his patent in any way changes this fact. "If the asserted result was inevitable in the method of the patents, it was inevitable in the method in use prior to the patents, • • •" *Foley, Admx. of Gathmann v. U. S.*, 260 U. S. 667, 676, 677, 43 S. Ct. 240, 67 L. Ed. 451.

Vitamin Technologists Case.

The alleged invention of the Bond patent is an exact parallel to the facts in the case of *Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation*, 146 F. (2d) 941, C. C. A. 9.

In the *Vitamin Technologists* case, Steenbock discovered that ultra-violet rays could irradiate foods with Vitamin D. While this was a new discovery of Steenbock, yet it was a condition that was occurring in nature and had occurred "from time immemorial by the farmer in hay-curing in the sun and the coconut grower sun-drying the cut meat of the coconut." (p. 949.) Steenbock had discovered the result of the effect of a natural law, which to him was new, but which to nature was old.

The Circuit Court, in the *Vitamin Technologists* case, saw clearly the distinction between a patent on an effect of the use of a law of nature and a patent on a law of nature. Steenbock's patent was not a patent on a law of nature "*per se*," but was a patent on the effect of the operation of a law of nature as found in an irradiated food product. So, there, the Court held that Steenbock did not "seek a monopoly of the ultra-violet rays of the sun or lamp, a natural force, * * *" (p. 949) but that Steenbock could not patent the effect produced by the ultra-violet rays of the sun or of a lamp, as that effect had been produced by these rays from time immemorial.

Steenbock's analytical mind recognized the true meaning of the effect of the application of ultra-violet rays to food products. But, recognition of a scientific truth so as to put one in a position to be able to utilize that scientific truth, is not invention. Invention can only be found in the production of a new, previously non-existing device, product or composition of matter. *LeRoy v. Tatham*, 14 How. 156, *supra; Morton v. New York Eye Infirmary*, 17 Fed. Cas. 881, *supra.*

His Honor, Judge Healy, in a concurring opinion in the *Vitamin Technologists* case, went even further to state that

Steenbock's discovery "would amount to no more than the ascertainment of a naked fact or principle in nature existing independently of the efforts of the discoverer."[38]

So in this case, assuming that Bond made a new discovery of the non-inhibitive characteristic of certain strains of the legume bacteria, he did no more than ascertain "a naked fact or principle in nature existing independently of the efforts of the discoverer." **If the bacteria did not function in exactly their natural way, Bond would have no product. He depends upon the law of nature to cause the bacteria to perform in their natural way and nothing that he does in any way affects their natural functioning. This functioning is completely independent of any effort of the patentee Bond, and he admits this fact.**[39]

The bacteria of the non-inhibitive kind have always existed in nature just like the actinic rays of the sun have always existed in nature. The bacteria have always produced their natural function of fixing nitrogen in the legume plants anywhere they could infect the roots of the legume plants just like the actinic rays of the sun have always irradiated the sun-cured hay and coconut meat.

It was stated in the *Vitamin Technologists* case to be absurd to entertain the proposition "that because the farmer and copra grower did not know the photochemical process involved in their immemorial practice, they may be enjoined as infringers." (p. 948, *Vitamin Technologists.*) So here, it would be absurd to entertain the proposition that because the producers of prior mixed inoculants did not know that they had both inhibitive and non-inhibitive strains of bacteria in their mixed inoculants, they may now be enjoined as infringers.

The most that can be said of the Bond patent is that it discloses an act or series of acts of selection, and as we have previously stated "the law does not protect the act

[38] See Appendix page 48.

[39] Testimony—R. 125.

of selection *per se*, however meritorious * * *." *Old Town Ribbon & Carbon Co. Inc. v. Columbia Ribbon and Carbon Mfg. Co.*, 159 F. (2d) 379, 382. (C. C. A. 2.)

IV. A PRODUCT CLAIM THAT RELIES FOR ITS NOVELTY UPON A STATEMENT OF FUNCTION IS INVALID.

Even if Bond was the first to discover the non-inhibitive bacteria, his discovery is not patentable for he makes the use or function of the result of the action of the bacteria the measure or test of the choice of the ingredients of the inoculant.

Bond admits in his patent that there is no way by which one can determine whether a strain of bacteria is inhibitive or not except by testing the strains of bacteria on their host plant, and thus makes selective testing a requirement to determine infringement or non-infringement by a mixed inoculant product.

This Court has held that no inventor may compel independent experimentation by others to ascertain the bounds of his claims. *Standard Brands, Inc. v. National Grain Yeast Corporation*, 308 U. S. 34, 60 S. Ct. 27, 84 L. Ed. 17.

Every element of the language of the claims of the Bond patent is old. Only by terms of function as to the result of the natural action of the bacteria do the Bond claims make any distinction from the prior art. The language of the claims is clearly within the condemnation of this Court as to the use of functional language at the exact point of alleged novelty in the claims, this Court stating in *Halliburton Oil Well Cementing Co. v. Walker et al.*, 329 U. S. 1, 9, 67 S. Ct. 6, 91 L. Ed. 15:

> "* * * The language of the claim thus describes this most crucial element in the 'new' combination in terms of what it will do rather than in terms of its own physical characteristics or its arrangement in the new combination apparatus. We have held that a claim with such a description of a product is invalid as a

violation of Rev. Stat. 4888. *Holland Furniture Co. v. Perkins Glue Co.*, 277 U. S. 245, 256-57; *General Electric Co. v. Wabash Appliance Corp., supra.* [304 U. S. 364]. * * *"

In the *General Electric* case, 304 U. S., 364, 58 S. Ct. 899, 82 L. Ed. 1402, this Court said:

"* * * But the vice of a functional claim exists not only when a claim is 'wholly' functional, if that is ever true, but also when the inventor is painstaking when he recites what has already been seen, **and then uses conveniently functional language at the exact point of novelty.**[11]" (p. 371.) (Emphasis ours.)

"[11] See *Gynex Corp. v. Dilex Institute*, 85 F. (2d) 103, 105; *Davis Co. v. New Departure Co.*, 217 F. 775, 782."

Here, there is no limiting of the Bond claims by the recitation of the non-inhibitive character of the bacteria for the functional language of the claims includes bacteria that not only do not inhibit one another under the Bond patent, but to the contrary, may have a beneficial effect on one another. The latter is within the scope of the language of the Bond claims as well as the former.

This, we think, is beyond the scope of the alleged Bond invention and is beyond the scope of any discovery of his.

Patentability of a Claim Involving a Mental Operation.

Bond's invention to be practiced requires a mental determination of whether you have inhibitive or non-inhibitive bacteria as a result of scientific tests and calculations. Where a claim involves mental steps as its essence, the claim is invalid. Not only is such a claim not an invention within the scope of the statute, because it is indefinite, but like its companion use of scientific principles and laws of nature, it does not fall within the classification of an art, a machine, an article of manufacture or a composition of matter.

In *Halliburton Oil Well Cementing Co. v. Walker*, 329 U. S. 1, 67 S. Ct. 6, 91 L. Ed. 15, a process claim that required intellectual operations necessary to interpret the data recorded, was held invalid. In this case the claims for the process likewise require a mental step of mathematical calculations, analysis and comparison of the tests to determine non-inhibitory characteristics of the bacteria, just as in the *Halliburton* case, to determine the depth of the well it was necessary to create an acoustical impulse, record the echo and then take the mental step of a mathematical calculation to determine well depth.

In both cases the practical difficulty arises of being able to tell how anyone performs the mental steps, and he is an infringer if he does. The public is entitled to certainty in a patent. But passing that problem, it is obvious that the mental step is another form of the law of nature which no patent claim can monopolize. In *Don Lee, Inc. v. Walker*, 61 F. (2) 58 (C. C. A. 9), a claim was directed to a method of computing the quantum, and also of counterbalances on Crankshafts by a mathematical formula. It was held invalid. This has been the position, as we understand it, on the law by the Courts.

The claims in this case, where they rely upon tests to determine what is inhibitory and non-inhibitory, are invalid because they fail to make the "full, clear, concise and exact" description of the alleged invention required by R. S. 4888.[40] How can one tell whether he has acquired a non-inhibitory strain? What rule in the claim or patent tells him when he has made an infringing intellectual determination, or when he has not? Likewise, the instant claims run afoul of R. S. 4888 because they do not describe the invention with precision, but use "conveniently functional language at the exact point of novelty." *General Electric Co. v. Wabash Appliance Corp.*, 304 U. S. 364, 371, 58 S. Ct.

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[40] See Appendix page 44.

899, 82 L. Ed. 1402. *Holland Furniture Co. v. Perkins Glue Co.*, 277 U. S. 245, 256-57, 48 S. Ct. 474, 72 L. Ed. 868.

In the *Halliburton* case there was no indication that the patentee contemplated any specific structural alteration in the electrical application, just as in this case there is no alteration in the bacteria or the humus in which the bacteria function. In both cases the law of nature of acoustical calculations and sound reactions and bacteriological action are unmodified by any contribution of the patentees. In both cases they have attempted to monopolize functionally indefinite mental processes never contemplated by patent law and excluded by its statutes.[41]

Non-Patentability of Therapeutic Methods.

As a further indication of the long policy of the Courts, it has been traditional in the Patent Office for more than sixty years to refuse patents, except in rare cases, relating to the medical treatment of the human body. The leading case in the Patent Office is the *Brinkerhoff* decision of 1883. (*Ex parte Brinkerhoff*, Commissioner's Manuscript Decision, Vol. 24, page 349, Case No. 132; 27 J. P. O. S. 797.) The methods and modes of treatments by physicians of diseases are not patentable because such discoveries or methods of treatment under all circumstances, and in all cases, will not produce upon all persons the same results. The laws of nature and intellectual ability of the physician render the matter unpatentable and too uncertain and indefinite to be subject to monopoly by definition.

Such claims are rejected because they do not meet the definition of an art or composition of matter. *Cochrane v. Deener*, 94 U. S. 780, 24 L. Ed. 139, defined an art as "An Act or series of acts performed upon a definite subject matter for the purpose of reducing it to a different state."

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[41] See discussion *George Washington Law Review*, June 1945, Vol. 13, No. 4, pages 498-499.

So it was that the Court in *Morton v. New York Eye Infirmary*, Fed. Case 9865, 17 Fed. Cas. 881 refused to sustain the patent for the use of ether as an anaesthetic. So it was in *Ex parte Mills*, 366 O. G. 477, the Examiner and Board of Appeals in the Patent Office holding that "the claims define nothing classifiable within either of the classes of patentable inventions." When Mills tried to patent the coagulative agent in blood, termed fibrinogen, he merely attempted to take advantage of a law of nature of this material without doing more. The Patent Office has followed almost universally the *Brinkerhoff* and *Morton* cases; and the Courts likewise proceed with great care in this area where the practice of an art is not the creation of the art.

V. PUBLIC IMPORTANCE.

In view of the vast increase in basic research in the use of bacteria in the field of medicine and industrial products as well as in the field of agriculture, the correctness and soundness of the decision of the Circuit Court of Appeals for the Seventh Circuit and the assertion of patent rights under it is of great moment to the public.

Unless the basic issue raised here is now settled by this Court, the decision of the Circuit Court of Appeals for the Seventh Circuit will cause judicial controversy for years to come regardless of the fact that the patent statute R. S. 4886 does not provide for patent protection on mere discoveries.

The possession and assertion of patent rights are "issues of great moment to the public." *Hazel-Atlas Glass Co. v. Hartford-Empire Co.*, 322 U. S. 238, 246, 64 S. Ct. 997, 88 L. Ed. 1250. See also *Mercoid Corp. v. Mid-Continent Investment Co.*, 320 U. S. 661, 665, 64 S. Ct. 268, 88 L. Ed. 376; *Morton Salt Co. v. Suppiger Co.*, 314 U. S. 488, 62 S. Ct. 402, 86 L. Ed. 363; *United States v. Masonite Corp.*, 316 U. S. 265, 278, 62 S. Ct. 1070, 86 L. Ed. 1461.

The far-reaching social and economic consequences of a patent, therefore, give the public a paramount interest **in seeing that patent monopolies are kept within their legitimate scope.** *Precision Instrument Manufacturing Co. et al. v. Automotive Maintenance Machinery Co.*, 324 U. S. 806, 816, 65 S. Ct. 993, 89 L. Ed. 1381.

In an age when our nation's security, our prosperity and our lives are dependent upon the free use of scientific discoveries as a part of the public domain, the paramount public interest demands that there be no private monopoly of such results of scientific discovery. "Discovery" and "invention" as used by the Statute clearly are limited to "new and useful art, machine, manufacture, or composition of matter" into which classifications scientific discoveries do not fall. The Statute is designed to reward man-made creation of something that never existed before.

To try to justify such monopoly on the ground that the discovery of the scientific law was "new" simply begs the question. "Discovery" and "invention" as defined by the Statute is that which the inventor creates for the public benefit *which never existed before,*—it does not apply to those things that have long existed as the laws of our existence, but which are newly revealed to us by diligent search of a scientist.

Respectfully submitted,

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APPENDIX A.

Pertinent Statutes.

R. S. 4886, 35 U. S. C. A. § 31:

Any person who has invented or discovered any new and useful art, machine, manuf cture, or composition of matter, or any new and useful improvements thereof, or who has invented or discovered and asexually reproduced any distinct and new variety of plant, other than a tuber-propagated plant, not known or used by others in this country, before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, or more than one year prior to his application, and not in public use or on sale in this country for more than one year prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceeding had, obtain a patent therefor. R. S. § 4886; March 3, 1897, c. 391, § 1, 29 Stat. 692; May 23, 1930; c. 312, § 1, 46 Stat. 376; Aug. 5, 1939, c. 450, § 1, 53 Stat. 1212.

R. S. 4888, 35 U. S. C. A. § 33:

Before any inventor or discoverer shall receive a patent for his invention or discovery he shall make application therefor, in writing, to the Commissioner of Patents, and shall file in the Patent Office a written description of the same, and of the manner and process of making, constructing, compounding, and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science, to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same; and in case of a machine, he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions; and he shall partic-

ularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery. The specification and claim shall be signed by the inventor. No plant patent shall be declared invalid on the ground of noncompliance with this section if the description is made as complete as is reasonably possible. R. S. § 4888; March 3, 1915, c. 94, § 1, 38 Stat. 958; May 23, 1930, c. 312, § 2, 46 Stat. 376.

APPENDIX B.

Bond Claims in Suit.

1. An inoculant for leguminous plants comprising plurality of selected cultures of different species of bacteri of the genus Rhizobium, one of said cultures being *Rhizobium trifolii alpha*, said cultures being substantially un affected by each other in respect to their ability to fi nitrogen in the leguminous plant for which they are specific

3. An inoculant for leguminous plants comprising humus and a mixture of species of bacteria of the genu Rhizobium, said mixture containing a strain of *Rhizobium trifolii alpha*.

4. An inoculant for leguminous plants comprising plurality of selected mutually non-inhibitive strains o different species of bacteria of the genus Rhizobium, sai strains being unaffected by each other in respect to thei ability to fix nitrogen in the leguminous plant for which the are specific.

5. An inoculant for leguminous plants comprising plurality of strains of different species of bacteria of th genus Rhizobium, at least one of which strains is un affected by the others in respect to its ability to fix nitroge in the leguminous plant for which it is specific.

6. An inoculant for leguminous plants comprising plurality of strains of different species of bacteria of th genus Rhizobium, the bacteria of each strain being presen in numbers of substantially the same order of magnitude said strains being substantially unaffected by each other i respect to their ability to fix nitrogen in the leguminou plant for which they are specific.

7. A bacterial inoculant for leguminous plants com prising a moist powder base and a plurality of selected mutually non-inhibitive strains of different species of bac teria of the genus Rhizobium including *Rhizobium tri folii*, the bacteria of each strain being present in number

of substantially the same order of magnitude, said strains being substantially unaffected by each other in respect to their ability to fix nitrogen in the leguminous plant for which they are specific.

8. A bacterial inoculant for leguminous plants comprising a moist powder base containing a substantially negligible concentration of bacterial nutrients and a plurality of strains of different species of bacteria of the genus Rhizobium, at least one of which strains is unaffected by the others in respect to its ability to fix nitrogen in the leguminous plant for which it is specific.

13. A bacterial inoculant for leguminous plants comprising a plurality of strains of different species of bacteria of the genus Rhizobium in numbers of substantially the same order of magnitude incorporated with a powder base, the mixture being substantially free of bacterial nutrients whereby growth of the bacteria therein is inhibited.

14. The inoculant as defined in claim 13 wherein one of said species is *Rhizobium trifolii*.

APPENDIX C.

Excerpt From Judge Healy's Concurring Opinion in Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation, 146 F. (2d) 941, 954 (C. C. A. 9).

I think the Steenbock patents are subject to an infirmity still more fundamental. Ultra-violet light is a natural form of energy. Like the sun, which is the source of that energy, and like the air we breathe, ultra-violet rays are the property of all mankind. Man may devise or improve machines for their more effective utilization and may obtain patents upon the machine or the improvement. But it would be a monstrous thing if the energy itself could be made the subject of a monopoly. It must be remembered that sunlight by its own inherent process activates the vitamin D principle in both inert and living tissues and substances, albeit, because of unfavorable atmospheric conditions, sunlight is not effective in all cases. Nevertheless it is clear that the artificial process differs in no essential particular from the natural one. The intervention of the mercury vapor lamp—developed long prior to Steenbock—may adapt the natural process to wider fields, but in a patentable sense the process itself is as ancient as the sun.

It seems to me doubtful that the claims should be held invalid because lacking in particularity in respect of the period of time of exposure. It may be that they are sufficiently specific to enable those skilled in the art to understand what is intended. I assume, therefore, that Steenbock discovered and sufficiently disclosed in his claims the most effective time period of exposure. Nevertheless such a discovery would not amount to a patentable invention. It would amount to no more than the ascertainment of a naked fact or principle in nature existing independently of the efforts of the discoverer. Cf. *O'Reilly v. Morse*, 15 How. 62, 14 L. Ed. 601; *Tilghman v. Proctor*, 102 U. S. 707, 722-729, 26 L. Ed. 279. If the discovery were patentable, it would be broader than the process itself in that it "would

over all processes which aim at the same result,"[1] including even the purposeful exposure of dietary substances to the direct rays of the sun.

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[1] *Walker on Patents*, Deller's Ed., Vol. 1, p. 65.